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A MERCURY COLUMN ALARM FOR STANDPIPES

BY W. E. HASELTINE

Our company was for many years troubled greatly by having the standpipe pumped over. The standpipe is located in a residence district and its overflow caused a great deal of complaint among the residents and often threats of lawsuit, besides which it was annoying to the company for the reason that the water would freeze on and around the standpipe in cold weather. There were a number of reasons why this pumping over occurred.

First. The standpipe is located nearly a mile from the pumping station and out of sight from the same.

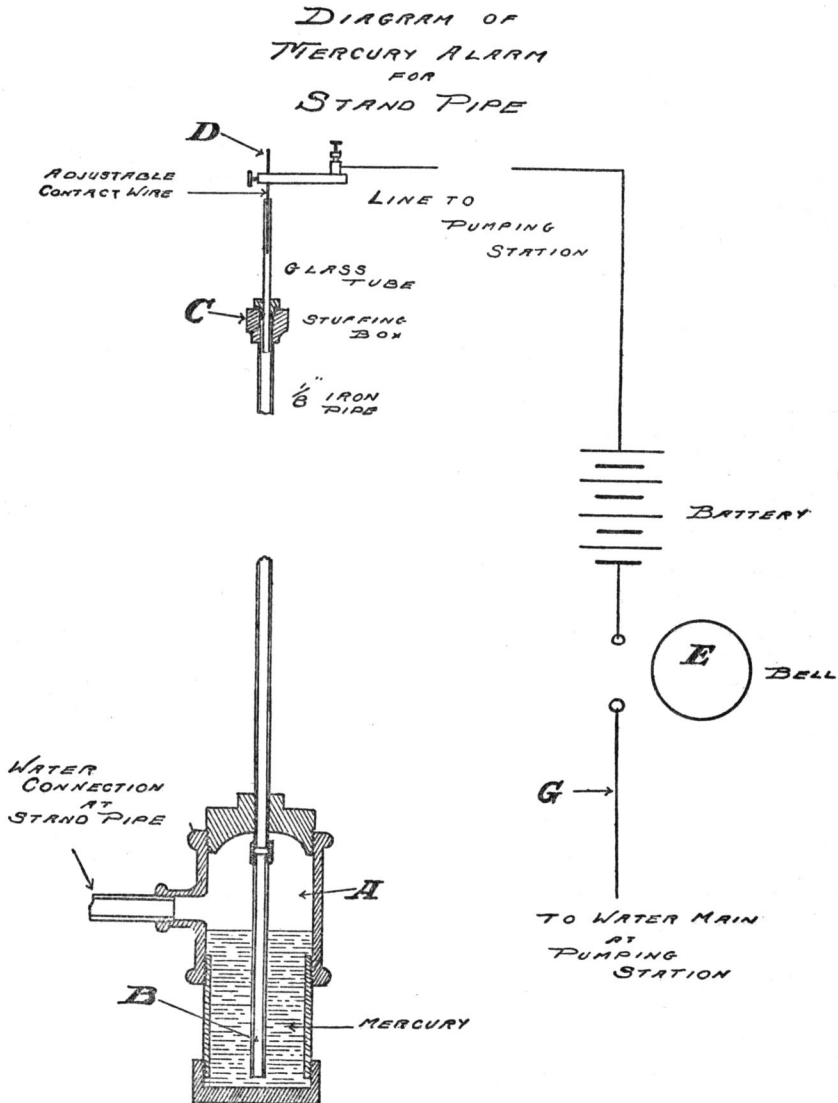
Second. The only means of telling when the standpipe was full was the pressure gauge at the pumping station, and the indications of this gauge would vary so greatly with the speed at which the pumps were running, the amount of water being used from the mains, etc., that it was not very reliable as an indicator, and unless the pumps were stopped at a point considerably below full standpipe we could never be sure that it would not run over.

Third. On account of the topography of our city, it was quite necessary to fill the standpipe almost to the top at every pumping to avoid an unnecessary amount of stopping and starting of the pumps and an increased pumping expense.

Many schemes were tried for correcting this condition, but with little success. A float making an electric contact was found impracticable on account of trouble with ice and excessive maintenance in other ways. A spring pressure gauge making an electric contact was also tried but, on account of the danger from freezing, this gauge had to be located in a damp valve pit underneath the standpipe, and the contacts consequently corroded and went out of business, and the gauge was also continually getting out of calibration.

The idea of a mercury column alarm then suggested itself, and after several attempts we succeeded in constructing one which has been in continuous service for almost nine years, and it has never failed to operate unless a wire to the pumping station has in some way been broken.

The accompanying drawing shows the general principle upon which this gauge is made and how it operates. A tap is made in the



pipe leading into the standpipe on the standpipe side of the valve controlling same, so that the gauge will never be subjected to excessive fire

pressures. This tap is connected by means of a regular corporation connection to the top of the mercury chamber *A*. Extending down into the mercury chamber is a small iron pipe *B* reaching nearly to the bottom, and this pipe extends vertically to a predetermined height, and about 6 inches of glass tubing is connected to the top thereof by means of a stuffing box *C*. This glass tubing is placed at such a height above the mercury chamber that at the time the standpipe is full the mercury column will stand at about the center of the glass tube. A metal contact *D* is arranged to slide up and down in this tube and this is connected to the wire leading to the pumping station, and the electrical circuit completed by the bell *E*, the set of batteries or bell ringing transformer *F* and the wire *G* attached to the water main at the station, this main making the return circuit.

The operation of the alarm is simplicity itself, the weight of the water column in the standpipe raises the column of mercury in proportion to its specific gravity until the mercury touches the contact *D*, when the bell rings at the station. The specific gravity of mercury being about 13.6, a 100 foot standpipe would require a mercury column something over 7 feet high.

This alarm has a number of advantages over any other that we are aware of. It is almost infallible, provided that the joints are made perfectly tight. It never has to be calibrated and is independent of barometer and practically of temperature. This latter is not strictly true, but we have found that the gauge operates perfectly at all temperatures that we get in this climate, from 100° above zero to 40° below.

The fact that 1 inch of mercury is practically equivalent to 1 foot of water makes it easy to set this gauge within one inch of water in the standpipe, which cannot be said of an alarm based on any other principle. The entire outfit can be made by any one at an expense not to exceed \$20 to \$25 outside of the line wire. About the only precaution which we would mention is: be sure to use an iron mercury chamber and iron pipe. Our ignorance of the fact that mercury would attack brass was the cause of much grief, and the loss of large quantities of mercury, but the final mercury chamber was made out of a short section of 2-inch pipe and a riser pipe out of $\frac{1}{4}$ inch ordinary black pipe.